OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **ROBINSON POND, HUDSON,** the program coordinators have made the following observations and recommendations:

Thank you for your continued hard work sampling the pond this season! Your monitoring group sampled **five** times this season and has done so for many years! As you know, multiple sampling events each season enable DES to more accurately detect water quality changes. Keep up the good work!

There are a number of tributaries within the watershed with elevated levels of conductivity, total phosphorus, turbidity, and/or *E.coli* that have continued to be areas of concern since DES conducted a Diagnostic/Feasibility Study for Robinson and Ottarnic Ponds in 1994. While it is important that the group continue to conduct baseline sampling at the deep spot and tributary stations to determine long-term trends, DES strongly recommends that the group conduct storm event and bracket sampling along the tributaries that pose the greatest threats to the quality of the pond. Since the 1994 study identified that Launch Brook contributes 37% of the tributary flow to pond and Howard Brook contributes 34%, while Beach Brook contributes 7%, and Juniper Brook contributes 6%, DES recommends that additional monitoring investigations should first be focused on Launch Brook and Howard Brook. If the group would like guidance on how to conduct rain event and bracket sampling, please contact the VLAP Coordinator. In addition, DES recommends that the group review the recommendations made in the 1994 Robinson and Ottarnic Ponds Diagnostic/Feasibility Study to minimize non-point source runoff into the pond.

A des Biologist will visit the lake during Summer 2006 to map the variable milfoil and fanwort growth in the lake. Also, an exotics plant talk is scheduled for May 8, 2006, at the Town Hall at 7:00 pm.

FIGURE INTERPRETATION

- **Figure 1 and Table 1:** Figure 1 (Appendix A) shows the historical and current year chlorophyll-a concentration in the water column. Table 1 (Appendix B) lists the maximum, minimum, and mean concentration for each sampling season that the pond has been monitored through VLAP.

  Chlorophyll-a, a pigment found in plants, is an indicator of the algal abundance. Because algae are usually microscopic plants that contain chlorophyll-a, and are naturally found in lake ecosystems, the chlorophyll-a concentration measured in the water gives an estimation of the algal concentration or lake productivity. **The median summer chlorophyll-a concentration for New Hampshire's lakes and ponds is 4.58 mg/m^3.**

  The current year data (the top graph) show that the chlorophyll-a concentration ***increased*** from **May** to **June**, ***decreased*** from **June** to **July**, ***increased*** from **July** to **August,** and ***increased greatly*** from **August** to **September.** The ***elevated*** chlorophyll concentration in **September (47.84 mg/m3)** indicates that an algal bloom had occurred in the pond.

  The historical data (the bottom graph) show that the 2005 chlorophyll-a mean is ***greater than*** the state median and the similar lake median (for more information on the similar lake median, refer to Appendix F). In addition, it is important to point out that the 2005 annual mean chlorophyll concentration is the ***highest*** annual mean that has been measured since monitoring began.

  Overall, visual inspection of the historical data trend line (the bottom graph) shows a ***variable*** in-lake chlorophyll-a trend since monitoring began. Specifically the mean concentration has ***fluctuated between approximately 6 and 16 mg/m^3*** since **2000**.

  After 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historical data to objectively determine if there has been a significant change in the annual mean chlorophyll-a concentration since monitoring began.

  While algae are naturally present in all ponds, an excessive or increasing amount of any type is not welcomed. In freshwater ponds, phosphorus is the nutrient that algae depend upon for growth. Algal concentrations may increase as nonpoint sources of phosphorus from the watershed increase, or as in-lake phosphorus sources increase (such as sediment phosphorus releases, known as internal loading). Therefore, it is extremely important for volunteer monitors to continually educate all watershed residents about activities within the watershed that affect phosphorus loading and pond quality.

- **Figure 2 and Table 3:** Figure 2 (Appendix A) shows the historical and current year data for pond transparency. Table 3 (Appendix B) lists the maximum, minimum and mean transparency data for each sampling season that the pond has been monitored through VLAP.

  Volunteer monitors use the Secchi-disk, a 20 cm disk with alternating black and white quadrants, to measure water clarity (how far a person can see into the water). Transparency, a measure of water clarity, can be affected by the amount of algae and sediment from erosion, as well as the natural colors of the water. **The median summer transparency for New Hampshire's lakes and ponds is 3.2 meters.**

  The current year data (the top graph) show that the in-lake transparency ***increased gradually*** from **May** to **September.**

  The historical data (the bottom graph) show that the 2005 mean transparency is ***slightly greater than*** the state median and the similar lake median (refer to Appendix F for more information about the similar lake median).

  Overall, visual inspection of the historical data trend line (the bottom graph) shows a ***relatively stable*** trend for in-lake transparency. Specifically, the transparency has ***remained relatively stable ranging between approximately 2.96 and 3.40 meters*** since monitoring began in **2000.**

  As previously discussed, after 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historical data to objectively determine if there has been a significant change in the annual mean transparency since monitoring began.

  Typically, high intensity rainfall causes sediment erosion to flow into ponds and streams, thus increasing turbidity and decreasing clarity. Efforts should continually be made to stabilize stream banks, pond shorelines, disturbed soils within the watershed, and especially dirt roads located immediately adjacent to the edge of tributaries and the pond. Guides to Best Management Practices designed to reduce, and possibly even eliminate, nonpoint source pollutants, such as sediment loading, are available from DES upon request.

- **Figure 3 and Table 8:** The graphs in Figure 3 (Appendix A) show the amount of epilimnetic (upper layer) phosphorus and hypolimnetic (lower layer) phosphorus; the inset graphs show current year data. Table 8 (Appendix B) lists the annual maximum, minimum, and median concentration for each deep spot layer and each tributary since the pond has joined VLAP.

  Phosphorus is the limiting nutrient for plant and algae growth in New Hampshire's freshwater lakes and ponds. Excessive phosphorus in a pond can lead to increased plant and algal growth over time. **The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire's lakes and ponds is 12 ug/L. The median summer phosphorus concentration in the hypolimnion (lower layer) is 14 ug/L.**

  The current year data for the epilimnion (the top inset graph) show that the phosphorus concentration ***decreased gradually*** from **May** to **July**, and then ***increased gradually*** from **July** to **September.**

  The historical data show that the 2005 mean epilimnetic phosphorus concentration is ***slightly greater than*** the state median and the similar lake median (refer to Appendix F for more information about the similar lake median).

  The current year data for the hypolimnion (the bottom inset graph) show that the phosphorus concentration ***increased greatly*** from **May** to **June,** ***decreased*** from **June** to **July,** ***increased*** from **July** to **August,** and then ***decreased slightly*** from **August** to **September.**

  The turbidity of the hypolimnion (lower layer) sample was ***highly elevated*** on the **June, August,** and **September** sampling events **(16.9, 12.9,** and **12.8 NTUs, respectively).** It is important to point out that the hypolimnetic turbidity has been ***at least slightly elevated*** on most sampling events since monitoring began. This suggests that the pond bottom is covered by a thick organic layer of sediment which is easily disturbed. When the pond bottom is disturbed, sediment, which typically contains attached phosphorus, is released into the water column. When collecting the hypolimnion sample, make sure that there is no sediment in the Kemmerer Bottle before filling the sample bottles.

  The historical data show that the 2005 mean hypolimnetic phosphorus concentration is ***much greater than*** the state median and the similar lake median (refer to Appendix F for more information about the similar lake median). It is also important to point out that the hypolimnetic phosphorus concentration is generally ***much***

greater in the hypolimnion than in the epilimnion which suggests that ***internal phosphorus loading*** is occurring in the hypolimnion.

Overall, visual inspection of the historical data trend line for the epilimnion shows an ***increasing, meaning worsening,*** phosphorus trend since monitoring began in **2000**.

Overall, visual inspection of the historical data trend line for the hypolimnion shows a ***variable*** phosphorus trend since monitoring began. Specifically the mean annual concentration has ***fluctuated between approximately 27 and 65 ug/L*** since monitoring began in **2000.**

As discussed previously, after 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historical data to objectively determine if there has been a significant change in the annual mean phosphorus concentration since monitoring began.

One of the most important approaches to reducing phosphorus loading to a waterbody is to continually educate watershed residents about its sources and how excessive amounts can adversely impact the ecology and the recreational, economical, and ecological value of lakes and ponds. Phosphorus sources within a pond's watershed typically include septic systems, animal waste, lawn fertilizer, road and construction erosion, and natural wetlands.

TABLE INTERPRETATION

- **Table 2: Phytoplankton**

  Table 2 (Appendix B) lists the current and historical phytoplankton species observed in the pond. Specifically, this table lists the three most dominant phytoplankton species observed in the sample and their relative abundance in the sample.

  The dominant phytoplankton species observed in the **May** sample were ***Dinobryon*** **(golden-brown),** ***Asterionella*** **(diatom),** and ***Anabaena*** **(cyanobacteria).**

  The dominant phytoplankton species observed in the **July** sample were an **unidentified filamentous blue-green algae,** ***Oscillatoria*** **(cyanobacteria),** and ***Spirulina*** **(cyanobacteria).**

  The dominant phytoplankton species observed in the **August** sample were ***Oscillatoria*** **(cyanobacteria)** and ***Anabaena*** **(cyanobacteria).**

The dominant phytoplankton species observed in the **September** sample were ***Microcystis*** **(cyanobacteria), unidentified filamentous blue-green algae,** and ***Anabaena*** **(cyanobacteria).**

Phytoplankton populations undergo a natural succession during the growing season (Please refer to the "Biological Monitoring Parameters" section of this report for a more detailed explanation regarding seasonal plankton succession). Diatoms and golden-brown algae are typical in New Hampshire's less productive lakes and ponds.

- **Table 2: Cyanobacteria**

  Various species of cyanobacteria, including ***Anabaena, Oscillatoria,*** and ***Microcystis***, were present in each of the 2005 plankton samples. ***These species, if present in large amounts, can be toxic to livestock, wildlife, pets, and humans.*** (Please refer to the "Biological Monitoring Parameters" section of this report for a more detailed explanation regarding cyanobacteria).

  Cyanobacteria can reach nuisance levels when phosphorus loading from the watershed to surface waters is increased (this is often caused by rain events) and favorable environmental conditions occur (such as a period of sunny, warm weather).

  The presence of cyanobacteria serves as a reminder of the pond's delicate balance. Watershed residents should continue to act proactively to reduce nutrient loading to the pond by eliminating fertilizer use on lawns, keeping the pond shoreline natural, re-vegetating cleared areas within the watershed, and properly maintaining septic systems and roads.

  In addition, residents should also observe the pond in September and October during the time of fall turnover (lake mixing) to document any algal blooms that may occur. Cyanobacteria have the ability to regulate their depth in the water column by producing or releasing gas from vesicles. However, occasionally lake mixing can affect their buoyancy and cause them to rise to the surface and bloom. Wind and currents tend to "pile" cyanobacteria into scums that accumulate in one section of the pond. If a fall bloom occurs, please collect a sample (any clean jar or bottle will be suitable) and contact the VLAP Coordinator.

- **Table 4: pH**
  Table 4 (Appendix B) presents the in-lake and tributary current year and historical pH data.

  pH is measured on a logarithmic scale of 0 (acidic) to 14 (basic). pH is important to the survival and reproduction of fish and other aquatic life. A pH below 6.0 limits the growth and reproduction of fish. A pH between 6.0 and 7.0 is ideal for fish. The median pH value for the epilimnion (upper layer) in New Hampshire's lakes and ponds is **6.6**, which indicates that the surface waters in the state are slightly acidic. For a more detailed explanation regarding pH, please refer to the "Chemical Monitoring Parameters" section of this report.

  The mean pH at the deep spot this season ranged from **6.64** in the hypolimnion to **7.13** in the epilimnion, which means that the water is ***slightly acidic*** near the lake bottom and ***slightly basic*** near the lake surface.

  It is important to point out that the pH in the hypolimnion (lower layer) was ***lower (more acidic)*** than in the epilimnion (upper layer). This increase in acidity near the lake bottom is likely due the decomposition of organic matter and the release of acidic by-products into the water column.

  Due to the presence of granite bedrock in the state and acid deposition (from snowmelt, rainfall, and atmospheric particulates) in New Hampshire, there is not much that can be done to effectively increase pond pH.

- **Table 5: Acid Neutralizing Capacity**
  Table 5 (Appendix B) presents the current year and historical epilimnetic ANC for each year the pond has been monitored through VLAP.

  Buffering capacity (ANC) describes the ability of a solution to resist changes in pH by neutralizing the acidic input. The median ANC value for New Hampshire's lakes and ponds is **4.9 mg/L**, which indicates that many lakes and ponds in the state are at least "moderately vulnerable" to acidic inputs. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

  The mean Acid Neutralizing Capacity (ANC) of the epilimnion (the upper layer) was **15.3 mg/L** this season, which is ***much greater than*** the state median. In addition, this indicates that the pond ***has a low vulnerability*** to acidic inputs (such as acid precipitation).

- **Table 6: Conductivity**
  Table 6 (Appendix B) presents the current and historical conductivity values for tributaries and in-lake data. Conductivity is the numerical expression of the ability of water to carry an electric current (which is determined by the number of negatively charged ions from metals, salts, and minerals in the water column). The median conductivity value for New Hampshire's lakes and ponds is **40.0 uMhos/cm**. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

  The mean annual conductivity in the epilimnion at the deep spot this season was **217.8 uMhos/cm**, which is ***much greater than*** the state median.

  The conductivity has ***increased*** at the deep spot and has ***increased*** or ***remained elevated*** in each of the inlet tributaries since monitoring began. Typically, sources of increased conductivity are due to human activity. These activities include failed or marginally functioning septic systems, agricultural runoff, and road runoff (which contains road salt during the spring snow melt). New development in the watershed can alter runoff patterns and expose new soil and bedrock areas, which could contribute to increasing conductivity. In addition, natural sources, such as iron and manganese deposits in bedrock, can influence conductivity.

  We strongly recommend that your monitoring group conduct a shoreline conductivity survey of the lake and the tributaries to help pinpoint the sources of conductivity to the pond.

  To learn how to conduct a shoreline or tributary conductivity survey, please refer to the 2004 "Special Topic Article" or contact the VLAP Coordinator.

  It is possible that de-icing materials applied to nearby roadways during the winter months may be influencing the conductivity in the pond. In New Hampshire, the most commonly used de-icing material is salt (sodium chloride).

  Therefore, we strongly recommend that your monitoring group conduct chloride sampling in the epilimnion at the deep spot and in the inlets near salted-roadways, particularly in the spring soon after snow-melt and after rain events during the summer. This will establish a baseline of data that will assist your monitoring group and DES to determine lake quality trends in the future.

  Please note that there will be an additional cost for each of the chloride samples and that these samples must be analyzed at the DES *laboratory in Concord. In addition, it is best to conduct chloride sampling in the spring as the snow is melting and during rain events.*

We also recommend that the association work with watershed residents to reduce the use of salt on private roads, driveways, and walkways. Watershed residents should be encouraged to implement a "low salt diet" for their property. For guidance, please read the 2005 DES Greenworks Article "Salt: An Emerging Issue for Water Quality" (January 2005) which can be accessed at www.des.nh.gov/gw0105.htm or from the VLAP Coordinator.

- **Table 8: Total Phosphorus**

Table 8 (Appendix B) presents the current year and historical total phosphorus data for in-lake and tributary stations. Phosphorus is the nutrient that limits the algae's ability to grow and reproduce. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

The total phosphorus concentration in the **Station 1 Beach Brook** was ***elevated*** on the **June** and **July** sampling events **(52 and 47 ug/L, respectively);** however, the turbidity of these samples was ***not particularly elevated (*****1.19 and 1 NTUs, respectively).**

The total phosphorus concentration in the **Station 3 Howard Brook** was ***elevated*** on the **May** and **June** sampling events **(58 and 289 ug/L, respectively).** The turbidity of the **May** sample was ***not particularly elevated*** **(1.89 NTUs).** The turbidity of the **June** and **July** samples was ***highly elevated*** **(16.6 and 60.7 NTUs).** (Please note that the phosphorus sample for the **July** sample was not processed by the laboratory.)

The total phosphorus concentration in the **Station 4 Juniper Brook** was ***highly elevated*** on the **August** sampling event **(156 ug/L);** however, the turbidity of this sample was ***not particularly elevated*** **(0.73 NTUs).**

The total phosphorus concentration in the **Station 5 Stony Lane Drainage** was ***elevated*** on the **June** and **July** sampling events **(35 and 43 ug/L, respectively).** The turbidity of these samples was ***also elevated*** **(21 and 13.4 NTUs, respectively).**

The total phosphorus concentration in the **Station 6 Woodcrest Brook** was ***particularly elevated*** on the **May** and **June** sampling events **(133 and 1680 ug/L, respectively).** The turbidity of **May** sample was ***not particularly elevated*** **(1.22 NTUs)**. The turbidity in the **June** sample was ***extremely elevated*** **(284 NTUs).** The laboratory staff noted that sediment was observed in the **June** sample bottle; however, it is unclear if the sediment was caused by suspended soil in the water column due to soil erosion or if the brook bottom was disturbed when the sample was collected.

The total phosphorus concentration in the **Station 7 ROW** was ***highly elevated*** on the **May** sampling event **(133 ug/L)** and the turbidity of this sample was ***elevated* (5.05 NTUs).** It is important to point out that the phosphorus concentration at this station was ***much lower*** on the **June, July, August** and **September** sampling events **(ranging from 11 to 29 ug/L).**

The total phosphorus concentration in the **Station 12 Camp Brook** was ***elevated*** on the **June** sampling event **(130 ug/L).** The turbidity of this sample was also ***elevated* (4.26 NTUs).**

When turbidity and phosphorus concentrations are elevated in a sample, it suggests that soil erosion is occurring in that area of the watershed. If you suspect that erosion is occurring in any area of the watershed, we recommend that your monitoring group conduct stream surveys and storm event sampling along each of the tributaries of concern. This additional sampling may allow us to determine what is causing the ***elevated*** levels of turbidity and phosphorus.

For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report "Special Topic Article" or contact the VLAP Coordinator.

- **Table 9 and Table 10: Dissolved Oxygen and Temperature Data**

  Table 9 (Appendix B) shows the dissolved oxygen/temperature profile(s) for the 2005 sampling season. Table 10 (Appendix B) shows the historical and current year dissolved oxygen concentration in the hypolimnion (lower layer). The presence of dissolved oxygen is vital to fish and amphibians in the water column and also to bottom-dwelling organisms. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

  The dissolved oxygen concentration was ***lower in the hypolimnion (lower layer) than in the epilimnion (upper layer)*** at the deep spot of the pond on the **May** sampling event. As stratified ponds age, and as the summer progresses, oxygen typically becomes ***depleted*** in the hypolimnion by the process of decomposition. Specifically, the loss of oxygen in the hypolimnion results primarily from the process of biological breakdown of organic matter (i.e.; biological organisms use oxygen to break down organic matter), both in the water column and particularly at the bottom of the pond where the water meets the sediment.

During this season, and many past sampling seasons, the pond has had a lower dissolved oxygen concentration and a higher total phosphorus concentration in the hypolimnion (lower layer) than in the epilimnion (upper layer). These data suggest that the process of ***internal phosphorus loading*** is occurring in the pond. When oxygen levels are depleted to less than 1 mg/L in the hypolimnion **(as it was this season and in many past seasons)**, the phosphorus that is normally bound up with metals in the sediment may be re-released into the water column. Since an internal source of phosphorus in the pond may be present, it is even more important that watershed residents act proactively to minimize phosphorus loading from the watershed.

- **Table 11: Turbidity**

  Table 11 (Appendix B) lists the current year and historical data for in-lake and tributary turbidity. Turbidity in the water is caused by suspended matter, such as clay, silt, and algae. Water clarity is strongly influenced by turbidity. Please refer to the "Other Monitoring Parameters" section of this report for a more detailed explanation.

  As discussed previously, the hypolimnetic turbidity has been ***at least slightly elevated*** on most sampling events since monitoring began. This suggests that the pond bottom is covered by a thick organic layer of sediment which is easily disturbed. When the pond bottom is disturbed, sediment, which typically contains attached phosphorus, is released into the water column. When collecting the hypolimnion sample, make sure that there is no sediment in the Kemmerer Bottle before filling the sample bottles.

  Also discussed previously, the turbidity and phosphorus level was elevated in many of the inlet tributaries on numerous sampling events this season which suggests that erosion is occurring throughout the watershed.

- **Table 12: Bacteria (*E.coli*)**

  Table 12 lists the current year and historical data for bacteria *(E.coli*) testing. (Please note that Table 12 now lists the maximum and minimum results for this season and for all past sampling seasons.) *E. coli* is a normal bacterium found in the large intestine of humans and other warm-blooded animals. *E.coli* is used as an indicator organism because it is easily cultured and its presence in the water, in defined amounts, indicates that sewage **MAY** be present. If sewage is present in the water, potentially harmful disease-causing organisms **MAY** also be present.

The *E.coli* concentration in **Station 12 Camp Brook** was ***elevated*** **(140 counts per 100mL)** on the **June** sampling event.

The *E.coli* concentration in **Station 1 Beach Brook** was ***elevated*** **(150 counts per 100mL)** on the **July** sampling event.

The *E.coli* concentration in **Station 3 Howard Brook** was ***elevated*** **(300 counts per 100mL)** on the **June** sampling event.

While these three *E.coli* sampling results ***were not greater than*** the state standard of 406 counts per 100 mL for recreational surface waters that are not designated public beaches, the results ***were greater than*** the state standard of 88 counts per 100 mL for surface waters that are designated public beaches.

The *E.coli* concentration in **Station 5 Stoney Lane Drainage** was ***elevated*** **(410 counts per 100mL)** on the **June** sampling event. This result was ***greater than*** the state standard of 406 counts per 100 mL for recreational surface waters that are not designated public beaches.

If residents are concerned about sources of bacteria in these areas such as failing septic systems, animal waste, or waterfowl waste, it is best to conduct *E. coli* testing when the water table is high, when beach use is heavy, or immediately after rain events.

- **Table 14: Current Year Biological and Chemical Raw Data**
  This table lists the most current sampling season results. Since the maximum, minimum, and annual mean values for each parameter are not shown on this table, this table displays the current year "raw" (meaning unprocessed) data. The results are sorted by station, depth zone (epilimnion, metalimnion, and hypolimnion) and parameter.

- **Table 15: Station Table**
  As of the Spring of 2004, all historical and current year VLAP data are included in the DES Environmental Monitoring Database (EMD). To facilitate the transfer of VLAP data into the EMD, a new station identification system had to be developed. While volunteer monitoring groups can still use the sampling station names that they have used in the past (and are most familiar with), an EMD station name also exists for each VLAP sampling location. For each station sampled at your pond, Table 15 identifies what EMD station name

corresponds to the station names you have used in the past and will continue to use in the future.

DATA QUALITY ASSURANCE AND CONTROL

Annual Assessment Audit:

During the annual visit to your pond, the biologist conducted a "Sampling Procedures Assessment Audit" for your monitoring group. Specifically, the biologist observed the performance of your monitoring group while sampling and filled out an assessment audit sheet to document the ability of the volunteer monitors to follow the proper field sampling procedures (as outlined in the VLAP Monitor's Field Manual). This assessment is used to identify any aspects of sample collection in which volunteer monitors fail to follow proper procedures, and also provides an opportunity for the biologist to retrain the volunteer monitors as necessary. This will ultimately ensure that the samples that the volunteer monitors collect are truly representative of actual lake and tributary conditions.

Overall, your monitoring group did an ***excellent*** job collecting samples on the annual biologist visit this season! Specifically, the members of your monitoring group followed the proper field sampling procedures and there was no need for the biologist to provide additional training. Keep up the good work!

Sample Receipt Checklist:

Each time your monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if the volunteer monitors followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, future re-occurrences of improper sampling techniques.

Overall, the sample receipt checklist showed that your monitoring group did a ***very good*** job when collecting samples this season! Specifically, the members of your monitoring group followed the majority of the proper field sampling procedures when collecting and submitting samples to the laboratory. However, the laboratory did identify a few aspects of sample collection that the volunteer monitors could improve upon. They are as follows:

- **Sample bottle volume:** Please make sure to fill each sample bottle up to the neck of the bottle (where the bottle curves in). This will ensure that the laboratory staff will have enough sample water to conduct all of the necessary tests.

Please be careful to not overflow the small brown bottle (total phosphorus bottle) since this bottle contains acid. If you do accidentally overflow the small brown bottle, please rinse your hands and the outside of the sample bottle and make a note of this on your field sampling sheet. The laboratory staff will put additional acid in the bottle in the laboratory to preserve the sample.

- **Tributary sampling:** Please do not sample tributaries that are not flowing. Due to the lack of flushing, stagnant water typically contains ***elevated*** amounts of chemical and biological constituents that will lead to erroneous results.

- **Tributary sampling:** Sediment/debris was observed in the white sample bottle for **Station 6** on the **June** sampling event. Please do not sample tributaries that are too shallow to collect a "clean" sample and do not sample the stream if the stream bottom has been disturbed. You may need to move upstream or downstream to collect a "clean" sample. If you disturb the stream bottom while sampling, please rinse out the bottle and move to an upstream location and sample in an undisturbed area.

USEFUL RESOURCES

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, NHDES Booklet WD-03-42, (603) 271-2975.

Canada Geese Facts and Management Options, NHDES Fact Sheet BB-53, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-53.htm.

Cyanobacteria in New Hampshire Waters Potential Dangers of Blue-Green Algae Blooms, NHDES Fact Sheet WMB-10, (603) 271-2975 or www.des.state.nh.us/factsheets/wmb/wmb-10.htm.

Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes, NHDES Fact Sheet WD-BB-9, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-9.htm.

Low Impact Development Hydrologic Analysis. Manual prepared by Prince George's County, Maryland, Department of Environmental Resources. July 1999. To access this document, visit www.epa.gov/owow/nps/lid_hydr.pdf or call the EPA Water Resource Center at (202) 566-1736.